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THE EFFECT BETWEEN VOCABULARY KNOWLEDGE ON EFL READING COMPREHENSION: A DESCRIPTIVE CORRELATIONAL STUDY

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ABSTRAK

Pemahaman bacaan merupakan keterampilan akademik yang sangat penting bagi pembelajar Bahasa Inggris sebagai Bahasa Asing (*English as a Foreign Language* / *EFL*). Penelitian kuantitatif deskriptif-korelasional dengan pendekatan potong-lintang (*cross-sectional*) ini bertujuan untuk menguji hubungan statistik antara pengetahuan kosakata reseptif dan pemahaman bacaan pada mahasiswa sarjana di Jurusan Pendidikan Bahasa Inggris *Universitas Islam Negeri* (*UIN*) Palangka Raya. Sebanyak 87 mahasiswa aktif dari angkatan 2023, 2024, dan 2025 dilibatkan melalui teknik penarikan sampel acak sederhana proporsional (*proportional simple random sampling*) berdasarkan perhitungan daya uji *a priori* menggunakan *G*Power 3.1*. Pengetahuan kosakata reseptif diukur menggunakan *Vocabulary Levels Test* (*VLT*) edisi mutakhir pada rentang frekuensi 2.000, 3.000, dan 4.000 kata, sedangkan pemahaman bacaan dievaluasi melalui tes objektif berbasis format *Test of English as a Foreign Language* (*TOEFL*). Analisis korelasi *Pearson product-moment* menunjukkan adanya hubungan positif yang signifikan secara statistik pada batas atas kategori sedang (r = 0,596, $p < 0{,}001$), dan uji *Welch's t-test* pascapembagian median (*median split*) memperlihatkan bahwa kelompok berkosakata tinggi memperoleh skor pemahaman bacaan yang lebih tinggi secara signifikan (t = 2,436, p = 0,018, d Cohen = 0,540). Temuan ini mengonfirmasi peran prediktif kosakata reseptif terhadap pemahaman bacaan teks akademik serta memberikan kontribusi empiris dari konteks perguruan tinggi Islam di Indonesia.

Kata Kunci: *korelasi, pemahaman bacaan EFL, pengetahuan kosakata reseptif, Vocabulary Levels Test.*

ABSTRACT

Reading comprehension represents a cornerstone of academic literacy for English as a foreign language (EFL) undergraduate learners. This cross-sectional descriptive-correlational inquiry investigates the statistical relationship between receptive vocabulary knowledge and reading comprehension among English education students at Universitas Islam Negeri (UIN) Palangka Raya. A total of 87 active undergraduates across three entry cohorts were recruited via proportional simple random sampling, satisfying the a priori sample size requirement determined using G*Power 3.1. Receptive vocabulary was operationalized using the updated Vocabulary Levels Test (VLT) across the 2,000-, 3,000-, and 4,000-word frequency bands, while reading comprehension was measured through a standardized 50-item TOEFL-based

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reading test. Pearson product-moment correlation analysis revealed a statistically significant, upper-moderate positive association between receptive vocabulary knowledge and reading comprehension performance ($r = .596$, $p < .001$), complemented by Welch's t-test showing higher comprehension scores among the high-vocabulary cohort ($t = 2.436$, $p = .018$, Cohen's $d = 0.540$). These findings substantiate the predictive value of high-frequency lexical competence in supporting academic reading comprehension within an Indonesian Islamic higher education setting.

Keywords: *correlation, EFL reading comprehension, receptive vocabulary knowledge, Vocabulary Levels Test.*

INTRODUCTION

Reading comprehension occupies a paramount position in tertiary education, serving as an indispensable conduit for acquiring disciplinary knowledge and engaging with international scholarship. In the Indonesian higher education context, however, undergraduate learners consistently encounter substantial difficulties in comprehending complex English academic prose (Hartono & Prima, 2021). Such persistent performance deficits have prompted applied linguists to examine the cognitive and linguistic factors that underwrite reading success. Understanding the primary linguistic correlates of comprehension is therefore vital for designing targeted pedagogical interventions in English as a foreign language (*EFL*) classrooms.

Among various linguistic dimensions, receptive vocabulary knowledge is widely recognized as a prominent predictor of second language reading comprehension. Receptive vocabulary denotes the lexical items that learners can successfully recognize and comprehend when encountered in written discourse, even if they cannot actively produce them in speech or writing (Schmitt, 2014). Because written comprehension fundamentally depends on decoding graphic symbols into semantic representations, receptive vocabulary size directly determines the degree of textual coverage available to the reader (Nation, 2006). When lexical coverage falls below critical benchmarks, readers are compelled to expend excessive cognitive capacity on word-level decoding, which inevitably impairs higher-order inference generation (Laufer & Ravenhorst-Kalovski, 2010). To measure this construct reliably, the Vocabulary Levels Test (*VLT*) developed by Schmitt et al. (2001) and updated by Webb et al. (2017) serves as the standard psychometric instrument across specific frequency tiers.

Substantial empirical scholarship across diverse international educational contexts validates the prominent association between receptive vocabulary size and reading comprehension. For instance, Ha (2021) identified receptive vocabulary knowledge as one of the strongest individual predictors of standardized reading proficiency among Vietnamese tertiary students. Similarly, Wang and Zhang (2025) reported that vocabulary breadth generated the most robust cross-lagged effects on reading comprehension development among Chinese university learners. A comprehensive meta-analysis conducted by Dong et al. (2020) further confirmed consistent moderate-to-strong correlation coefficients across heterogeneous second language learner populations. In Indonesia, Hartono and Prima (2021) documented a positive correlation between receptive vocabulary and reading comprehension among general university students, highlighting the foundational role of lexical breadth.

Notwithstanding this accumulated evidence, empirical investigations situated within Islamic higher education institutions in Indonesia remain comparatively scarce. Previous national studies have largely examined general university populations without implementing

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rigorous frequency-band lexical diagnostics alongside standardized comprehension measures (Hartono & Prima, 2021; Muniroh et al., 2025). Consequently, there is an evident need to examine whether high-frequency lexical bands systematically correlate with academic reading comprehension among Islamic university undergraduates. To address this empirical gap, the present study investigates the relationship between receptive vocabulary knowledge across the 2,000-, 3,000-, and 4,000-word bands and *TOEFL*-based reading comprehension at *Universitas Islam Negeri* (*UIN*) Palangka Raya. Specifically, this inquiry addresses two central research questions: (1) Is there a statistically significant correlation between receptive vocabulary knowledge and reading comprehension? and (2) Does reading comprehension performance differ significantly between high- and low-vocabulary learner groups?

RESEARCH METHOD

This investigation employed a quantitative, non-experimental, cross-sectional descriptive-correlational design to examine the statistical relationship between receptive vocabulary knowledge and reading comprehension. The target population comprised 112 active undergraduate students enrolled across the 2023, 2024, and 2025 cohorts of the English Education Department at *UIN* Palangka Raya. An *a priori* statistical power analysis was executed in *G*Power 3.1* (Faul et al., 2009), specifying a bivariate normal correlation model with a medium effect size ($r = .30$), an alpha level of .05, and a statistical power of .80, which established a minimum sample threshold of 84 respondents. Proportional simple random sampling was implemented across cohorts, drawing 29 participants from the 2023 cohort, 29 from the 2024 cohort, and 29 from the 2025 cohort to assemble an initial sample of 87 students. Following data screening for response completeness, all 87 participants yielded fully usable datasets without missing values, thereby satisfying both proportional representation and statistical power criteria.

Receptive vocabulary knowledge was assessed using the updated Vocabulary Levels Test (*VLT*) developed and validated by Webb et al. (2017). The instrument comprised 50 multiple-choice matching items distributed across three frequency tiers: 20 items for the 2,000-word band, 20 items for the 3,000-word band, and 10 items for the 4,000-word band, yielding an empirical Cronbach's alpha of .84 in the present sample. Reading comprehension was operationalized through a 50-item multiple-choice test derived from standardized *TOEFL* reading passages assessing main ideas, factual details, vocabulary in context, and inferential reasoning (Baghaei et al., 2020). Content validity for both instruments was established through independent expert judgment by two senior applied linguistics faculty members, and the reading comprehension test achieved an empirical reliability coefficient of Cronbach's alpha = .88. Both assessments were administered in supervised classroom sessions with strict adherence to standardized timing protocols and informed consent procedures.

All statistical procedures were conducted using *JASP 0.19* software (JASP Team, 2024; Love et al., 2019). Preliminary data screening involved computing descriptive statistics and testing parametric assumptions, where the Shapiro-Wilk test confirmed univariate normality ($p > .05$ for both variables) and Levene's test verified variance homogeneity ($F = 1.842$, $p = .178$). The primary bivariate relationship was evaluated through Pearson product-moment correlation analysis (r) with a 95% confidence interval at an alpha level of .05. To examine group-level contrasts, a median-split procedure based on the sample median *VLT* score of 39 divided participants into high-vocabulary (scores ≥ 39, $n = 48$) and low-vocabulary cohorts (scores < 39, $n = 39$). Between-group differences in reading comprehension were subsequently examined

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using Welch's independent samples *t*-test, accompanied by Cohen's *d* effect size calculation (Cohen, 1988).

RESULT AND DISCUSSION

Result

Data screening confirmed that all 87 undergraduate participants completed the *VLT* and the *TOEFL*-based reading comprehension test under standardized conditions. Prior to inferential testing, descriptive statistics were calculated for the overall sample and disaggregated by demographic subgroups to capture distributional characteristics. Table 1 summarizes the overall and subgroup descriptive parameters, including mean values, standard deviations, and score ranges for both focal variables. Examining these preliminary parameters provides essential context regarding the baseline dispersion of vocabulary breadth and reading proficiency across the surveyed cohort.

Table 1. Descriptive Statistics of Overall Sample and Gender Subgroups (*N* = 87)

Sample Group	N	VLT Mean (SD)	VLT Range [Min, Max]	Reading Mean (SD)	Reading Range [Min, Max]
Overall Cohort	87	38.724 (5.684)	[20.000, 50.000]	38.391 (5.704)	[17.000, 49.000]
Male Students	48	38.949 (5.902)	[21.000, 50.000]	39.692 (4.725)	[28.000, 49.000]
Female Students	39	38.542 (5.496)	[20.000, 45.000]	37.333 (6.389)	[17.000, 49.000]

Note. VLT = Vocabulary Levels Test; SD = Standard Deviation.

As delineated in Table 1, the overall sample demonstrated a mean *VLT* score of 38.724 (*SD* = 5.684) out of a maximum of 50 points, alongside a mean reading comprehension score of 38.391 (*SD* = 5.704). Disaggregation by gender subgroup revealed comparable receptive vocabulary profiles between male students (*M* = 38.949, *SD* = 5.902) and female students (*M* = 38.542, *SD* = 5.496). Male respondents exhibited a slightly higher mean reading comprehension score (*M* = 39.692, *SD* = 4.725) compared to female respondents (*M* = 37.333, *SD* = 6.389), reflecting modest distributional variation within the cohort. Overall, the wide dispersion of observed scores across both measures confirms sufficient variance within the dataset to support rigorous bivariate correlation analysis.

To address the primary research question regarding the association between receptive vocabulary knowledge and reading comprehension, inferential statistical analyses were executed. Parametric assumptions were thoroughly verified, confirming univariate normality via the Shapiro-Wilk test ($W = 0.978$, $p = .152$ for *VLT*; $W = 0.971$, $p = .054$ for reading scores). Pearson product-moment correlation was subsequently calculated in *JASP 0.19* to ascertain the strength, direction, and precision of the linear association between the two continuous variables. Table 2 details the bivariate correlation coefficient, associated exact probability value, sample size, and 95% confidence intervals.

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Table 2. Pearson Product-Moment Correlation between Receptive Vocabulary and Reading Comprehension

Variable Pair	Sample Size (N)	Pearson's r	95% Confidence Interval	p-value	Statistical Decision
***VLT* Score (X) – Reading Score (Y)**	87	.596	[.445, .715]	< .001	Statistically Significant

Note. Significant at the p < .001 level (two-tailed).

The inferential statistics displayed in Table 2 document a statistically significant, positive correlation between receptive vocabulary knowledge and reading comprehension (r = .596, 95% CI [.445, .715], p < .001). Benchmarked against conventional psychometric standards, this coefficient of .596 resides at the upper boundary of the moderate category and borders on a strong linear association (Cohen, 1988). The narrow 95% confidence interval reported in Table 2 further confirms the stability and precision of this positive linear relationship within the surveyed population. These statistical outcomes indicate that higher receptive vocabulary mastery across high-frequency word bands is consistently associated with superior academic reading comprehension performance.

To address the secondary research question, participants were stratified into high- and low-vocabulary groups via a median split on the *VLT* distribution. The empirical median score of 39 served as the separation boundary, assigning students with scores of 39 and above to the high-vocabulary group (n = 48) and those below 39 to the low-vocabulary group (n = 39). A Welch's independent samples t-test was conducted to evaluate whether reading comprehension scores differed significantly between these two empirically defined lexical groups. Table 3 presents the comparative group descriptive statistics, inferential test parameters, degrees of freedom, and standardized effect size estimates.

Table 3. Comparative Group Descriptives and Welch's Independent Samples *T*-Test Results

Vocabulary Group	N	Reading Mean (SD)	Standard Error	Welch's t	df	p-value	Cohen's d [95% CI]
High Vocabulary (≥ 39)	48	39.792 (3.842)	0.555	2.436	55.126	.018	0.540 [0.098, 0.978]
Low Vocabulary (< 39)	39	36.667 (7.223)	1.157				

Note. Welch's t-test applied due to unequal group variances; significant at p < .05.

As shown in Table 3, learners in the high-vocabulary cohort achieved significantly higher reading comprehension scores (M = 39.792, SD = 3.842) than their low-vocabulary peers (M = 36.667, SD = 7.223), t(55.126) = 2.436, p = .018. The standardized mean difference yielded a Cohen's d of 0.540 (95% CI [0.098, 0.978]), denoting a medium practical effect size under conventional evaluative criteria (Cohen, 1988). Inspection of Table 3 also indicates greater descriptive dispersion within the low-vocabulary group (SD = 7.223) relative to the high-vocabulary group (SD = 3.842), reflecting notable heterogeneity in comprehension outcomes among weaker lexical performers. While this median split effectively illustrates

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group-level differentiation, the observed variance within the low-vocabulary cohort highlights that vocabulary deficits may interact with diverse learner-level factors.

To complement the tabular summaries, the linear relationship between receptive vocabulary knowledge and reading comprehension was visualized through a bivariate scatter distribution. Visual inspection provides an intuitive perspective on how individual data points cluster around the linear regression trajectory across the observed score spectrum. Figure 1 illustrates the distribution of individual participant scores on the *VLT* plotted against their corresponding *TOEFL*-based reading comprehension scores. This graphical representation allows for a direct visual appraisal of the bivariate linear trend that underpins the obtained Pearson correlation coefficient.

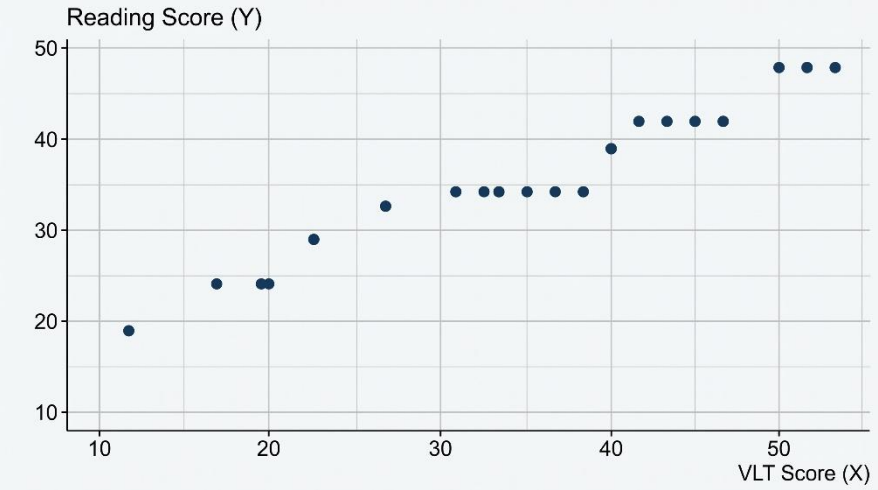


Figure 1. Scatter Plot of Receptive Vocabulary Scores versus Reading Comprehension Scores

The visual dispersion depicted in Figure 1 corroborates the positive directional trend substantiated by the statistical correlation analysis. Data points in Figure 1 demonstrate an upward trajectory, showing that participants with higher *VLT* scores consistently cluster toward higher reading comprehension outcomes. Furthermore, the diagram confirms the absence of extreme multivariate outliers that could artificially inflate or distort the estimated association. Consequently, the visual profile displayed in Figure 1 reinforces the conclusion that receptive vocabulary breadth functions as a stable correlate of *EFL* reading comprehension.

Discussion

The principal finding of this inquiry establishes a statistically significant, moderate-to-strong positive association between receptive vocabulary knowledge and *EFL* reading comprehension. This empirical outcome aligns with Nation's (2006) lexical threshold hypothesis, which posits that adequate recognition of high-frequency word families is essential for fluent comprehension of written texts. When readers possess adequate receptive knowledge across the 2,000- to 4,000-word tiers, cognitive resources can be allocated toward higher-level comprehension processes such as synthesizing contextual details and inferring implicit textual meanings (Laufer & Ravenhorst-Kalovski, 2010). Conversely, limited vocabulary knowledge likely constrains cognitive processing, requiring readers to expend attentional resources on resolving individual lexical hurdles. The present findings thus provide empirical confirmation that receptive lexical breadth serves as an essential linguistic correlate of academic reading comprehension.

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The current findings critically corroborate and extend previous empirical inquiries across diverse international and national higher education contexts. The observed correlation coefficient (r = .596) closely mirrors the findings of Ha (2021), who documented receptive vocabulary as a dominant predictor of standardized reading scores among Vietnamese university students. In the Indonesian tertiary sphere, the present results converge with Hartono and Prima (2021), who also established a significant positive correlation between receptive vocabulary size and reading comprehension levels among university undergraduates. However, while Hartono and Prima (2021) examined general university learners without isolating specific lexical frequency tiers, the current study systematically operationalized band-specific mastery across the 2,000-, 3,000-, and 4,000-word bands alongside standardized *TOEFL* reading passages. Furthermore, our findings resonate with the meta-analytic synthesis of Dong et al. (2020) and the longitudinal modeling of Wang and Zhang (2025), demonstrating the robust relationship between lexical breadth and second language reading competence.

The group comparison between high- and low-vocabulary cohorts further illuminates the practical relevance of vocabulary knowledge in academic reading tasks. The significant performance advantage observed among high-vocabulary learners reflects a medium effect size, confirming meaningful group-level divergence along lexical lines (Cohen, 1988). Interestingly, the low-vocabulary group exhibited substantially wider score dispersion than the high-vocabulary group, as reflected in their larger standard deviation and coefficient of variation. Rather than assuming a single explanatory mechanism such as random guessing, this wider score variability likely reflects multiple unmeasured cognitive and pedagogical factors, including background knowledge, reading anxiety, or varied test-taking persistence (Warnby et al., 2023). Methodologically, transforming continuous vocabulary scores into categorical groups through a median split carries recognized limitations, but it effectively illustrates the distinct performance profiles present across lower and higher lexical bands (Ha, 2021; Pulido, 2021; Webb et al., 2023; Zhang & Graham, 2020; Zhou & Li, 2021).

From a pedagogical perspective, the findings offer constructive implications for instructional design in tertiary *EFL* reading programs. Rather than suggesting that reading strategy training is futile, the evidence indicates that strategy instruction should be balanced and integrated with systematic, frequency-informed vocabulary development (Schmitt, 2014). Curricula should incorporate explicit lexical instruction targeting high-frequency word bands alongside comprehension strategies, ensuring that struggling readers acquire the semantic foundation needed to execute skimming, scanning, and inferencing effectively. In addition, the heterogeneous performance observed among low-vocabulary students highlights the necessity of differentiated instruction and targeted diagnostic assessment to support learners with varied lexical needs. By integrating structured lexical acquisition with authentic reading tasks, tertiary institutions can foster more sustainable gains in academic reading comprehension.

CONCLUSION

This study investigated the relationship between receptive vocabulary knowledge across high-frequency word bands and *EFL* reading comprehension among undergraduate students at *Universitas Islam Negeri* (*UIN*) Palangka Raya. The empirical findings reveal a statistically significant, moderate-to-strong positive association between receptive vocabulary size and *TOEFL*-based reading comprehension performance. In addition, categorical comparison demonstrated that students with higher receptive vocabulary knowledge achieved significantly higher reading comprehension scores compared to their lower-vocabulary peers. These

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outcomes substantiate the theoretical premise that receptive lexical breadth serves as a prominent linguistic correlate of second language reading comprehension within an Indonesian Islamic university setting.

Nevertheless, several methodological limitations must be acknowledged, including the non-experimental cross-sectional design which precludes causal inferences regarding vocabulary and reading development. Furthermore, the reliance on a median-split classification reduced continuous data variance, and the sampling frame was restricted to a single department within one institution. Pedagogically, reading curricula should integrate systematic high-frequency vocabulary instruction with comprehension strategy development rather than treating lexical learning as a secondary component. Future research should employ longitudinal multi-institution designs and incorporate measures of vocabulary depth alongside receptive breadth to provide a more comprehensive understanding of lexical and reading development.

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